Armed Forces College of Medicine

AFCM

كلية الطب بالقوات المسلحة
Armed Forces College of Medicine

Innate Immunity
(Part 3)

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Components & Reactions of Innate Immunity

Mechanical & Chemical barriers

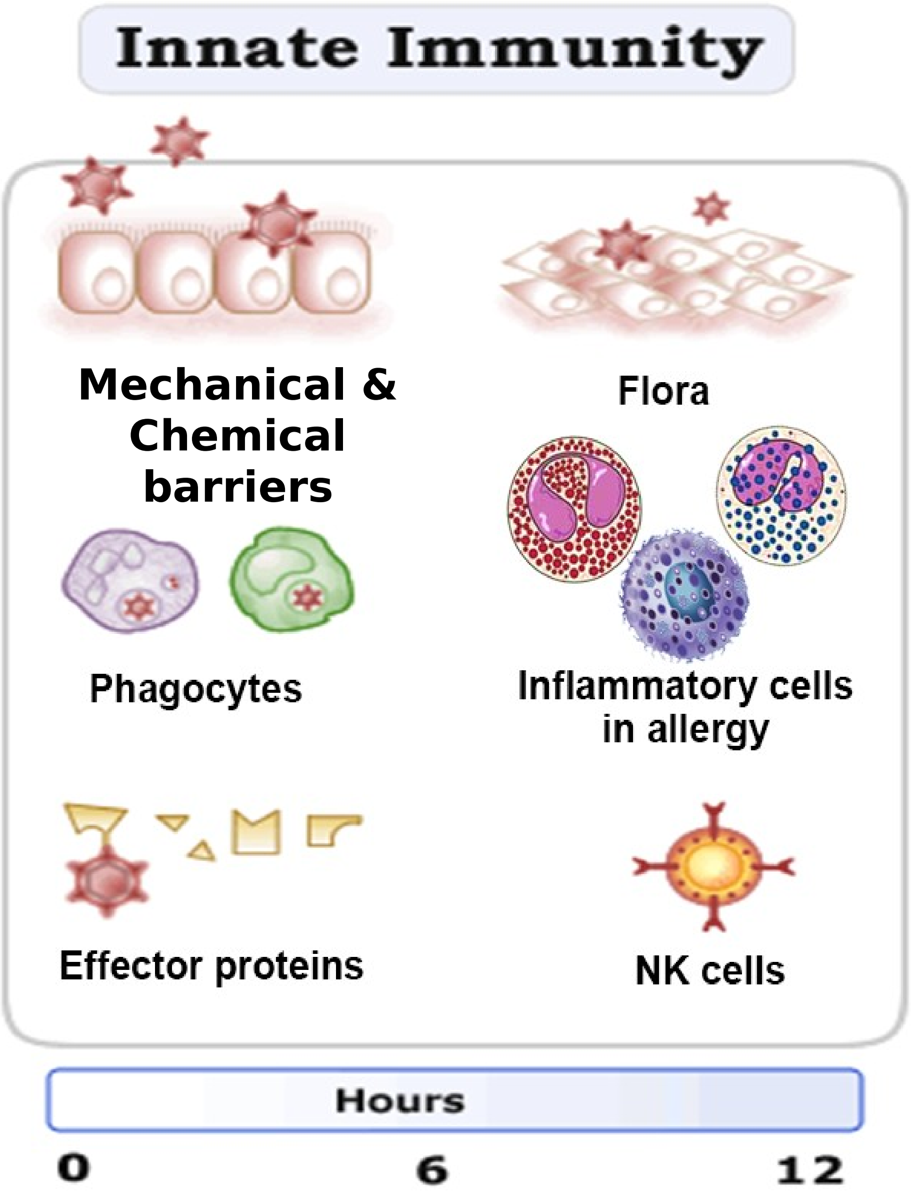
Normal Microbial flora

Inflammation

Phagocytes & Phagocytosis

Inflammatory cells involved in allergy

Circulating effector proteins



V) Circulating effector proteins

Complement

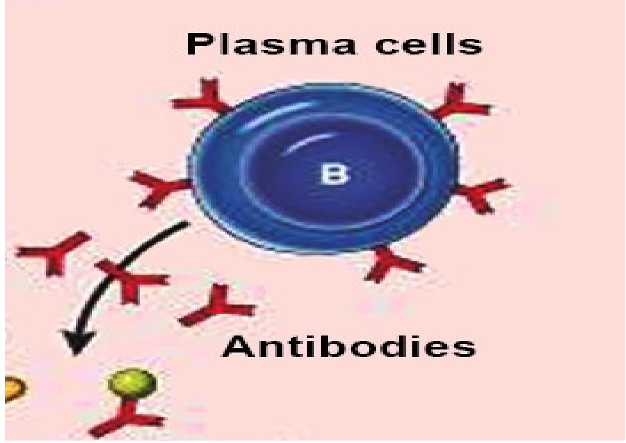
2C

Cytokines

Acute phase proteins

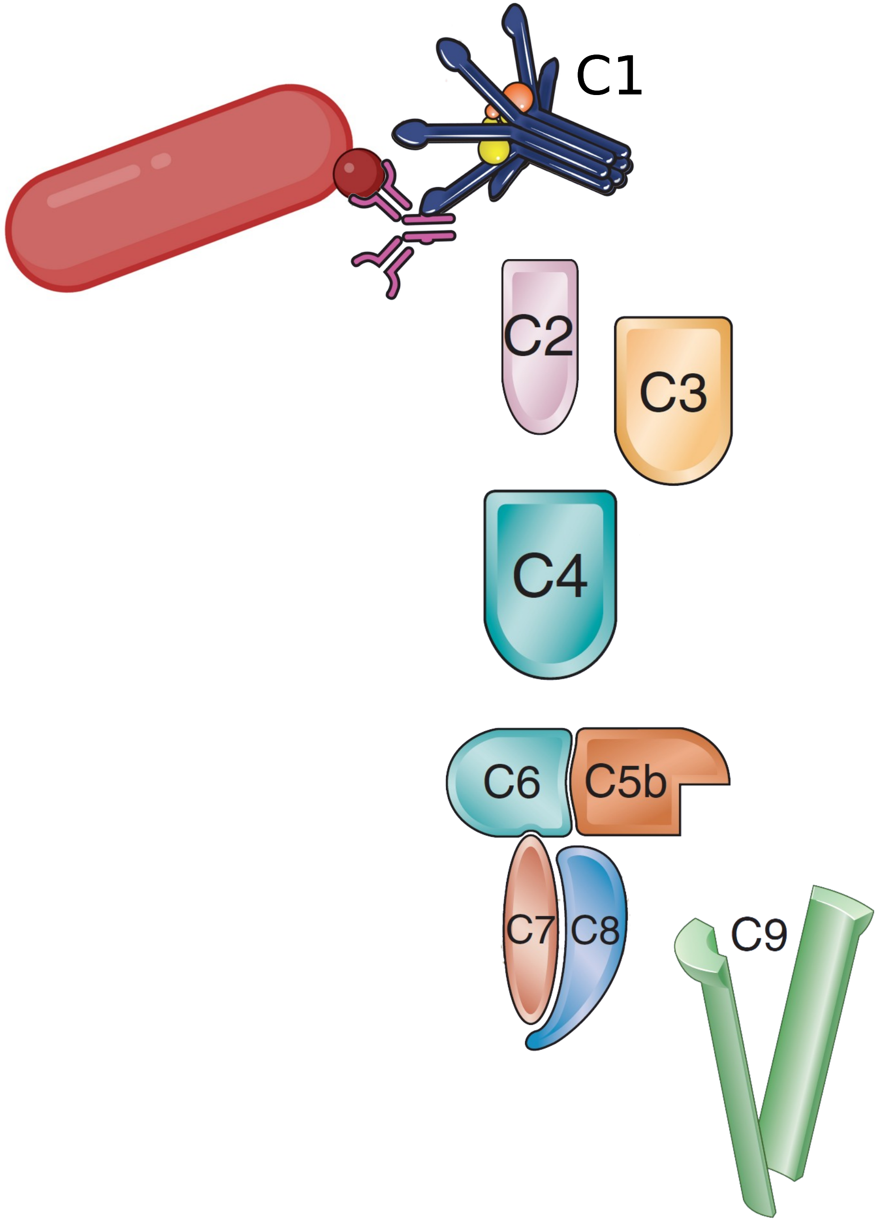
2A

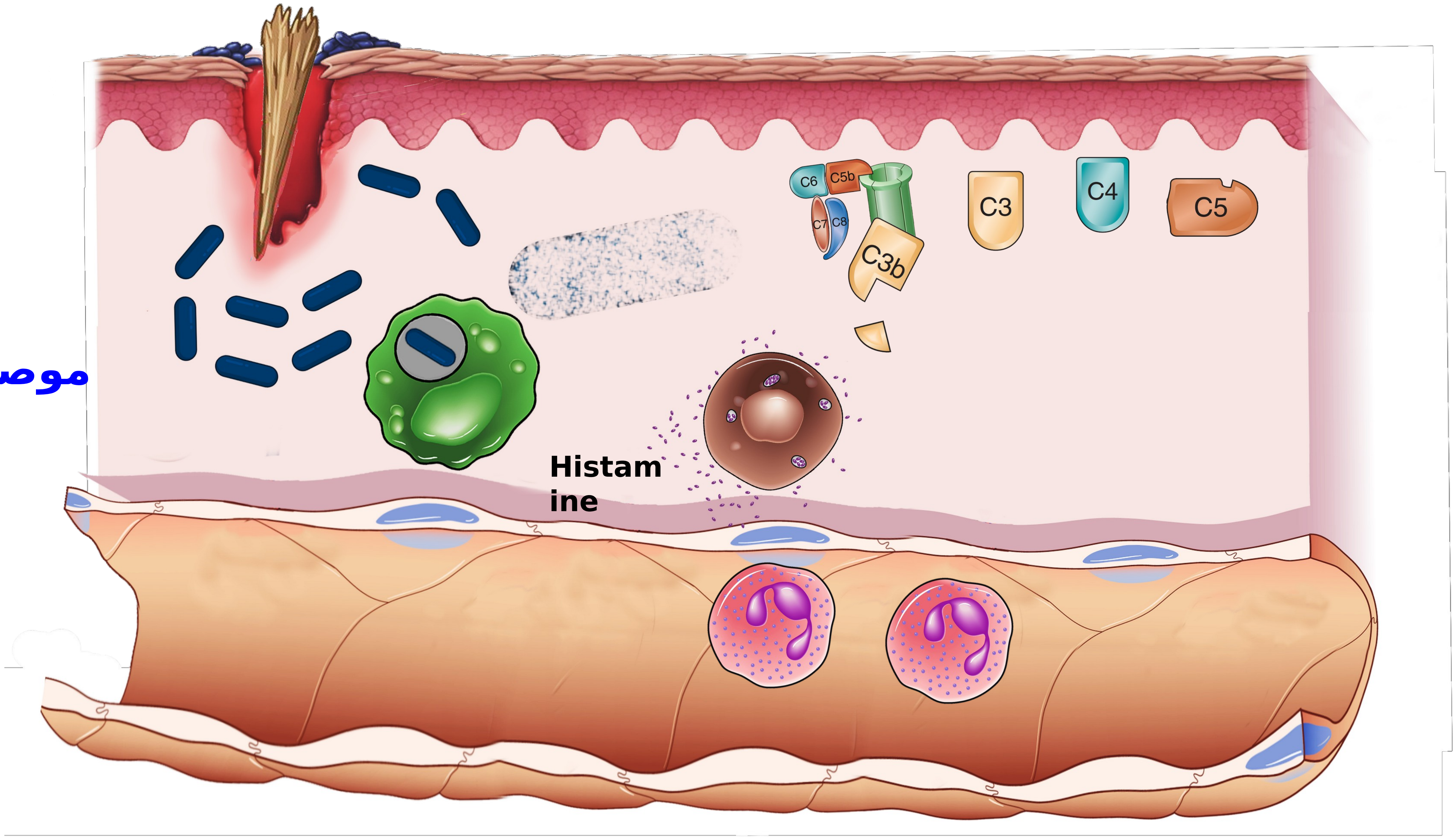
Antibodies



Complement

- **Site** Blood & tissue fluids
- **Characters**

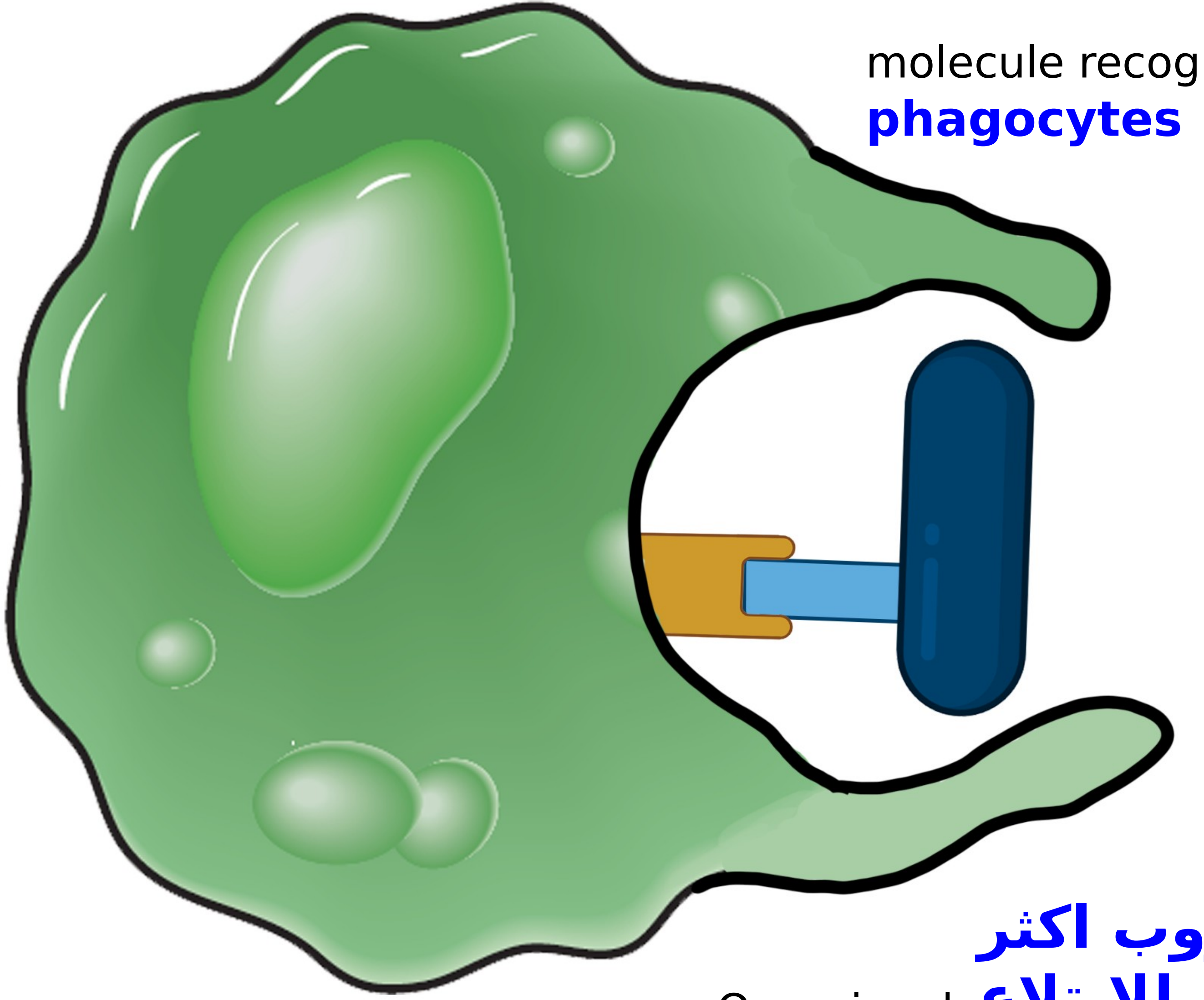



قاتل
موصلاتي
Histamine
C6
C5b
C7
C8
C3b
C3
C4
C5
مذ

Opsonization (enhancement of phagocytosis)

Opsonin **الموصلاتي**

molecule recognized by **receptor on phagocytes**



الموصلاتي يجعل الميكروب اكثر عرضة للابتلاع

Organism becomes more susceptible to phagocytosis

Complement

➲ Site

Blood & tissue fluids

➲ Characters

Complement proteins (C1-C9) circulate in inactive form

↓

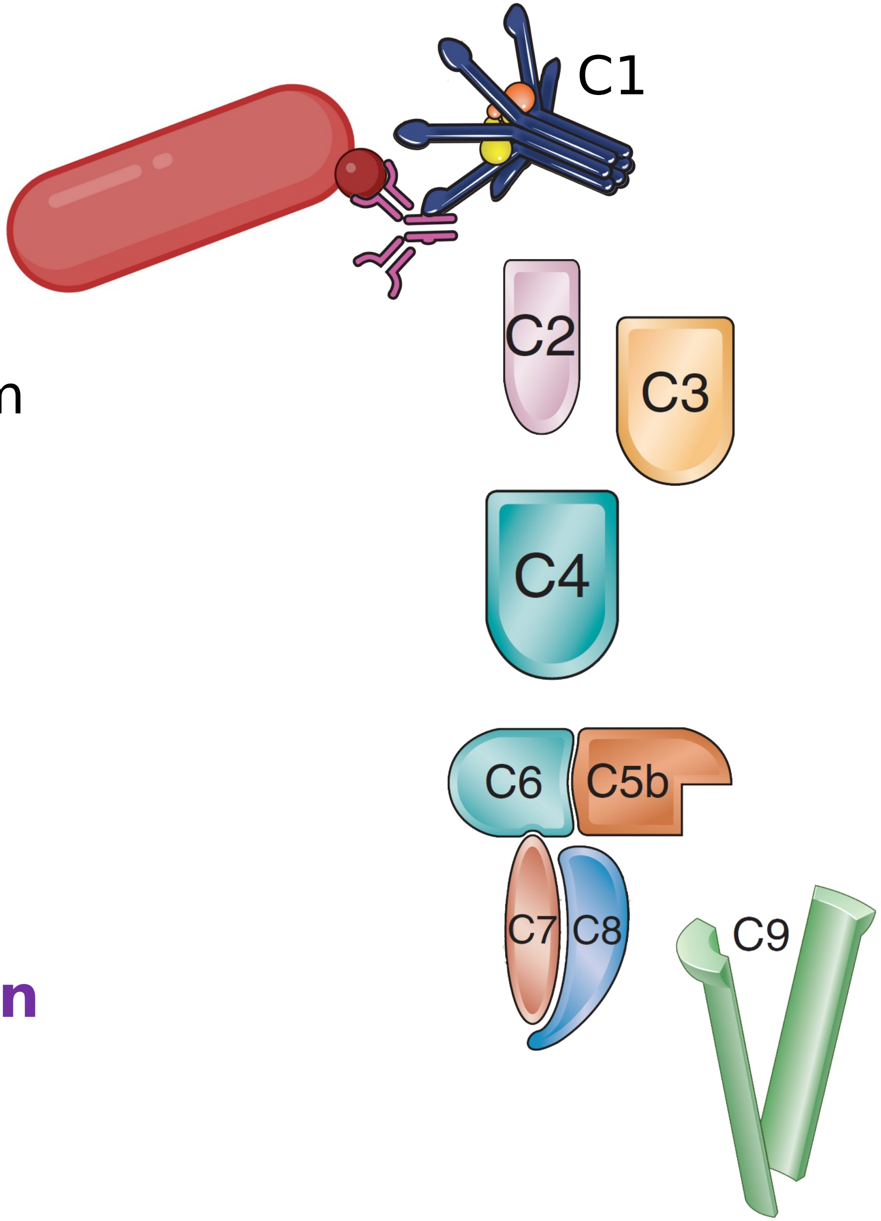
Activated directly by microbes

➲ Functions

1-Direct lysis of microbe (cytolysis)

2-Recruitment of leukocytes : inflammation

3-Enhance phagocytosis (opsonization)



V) Circulating effector proteins

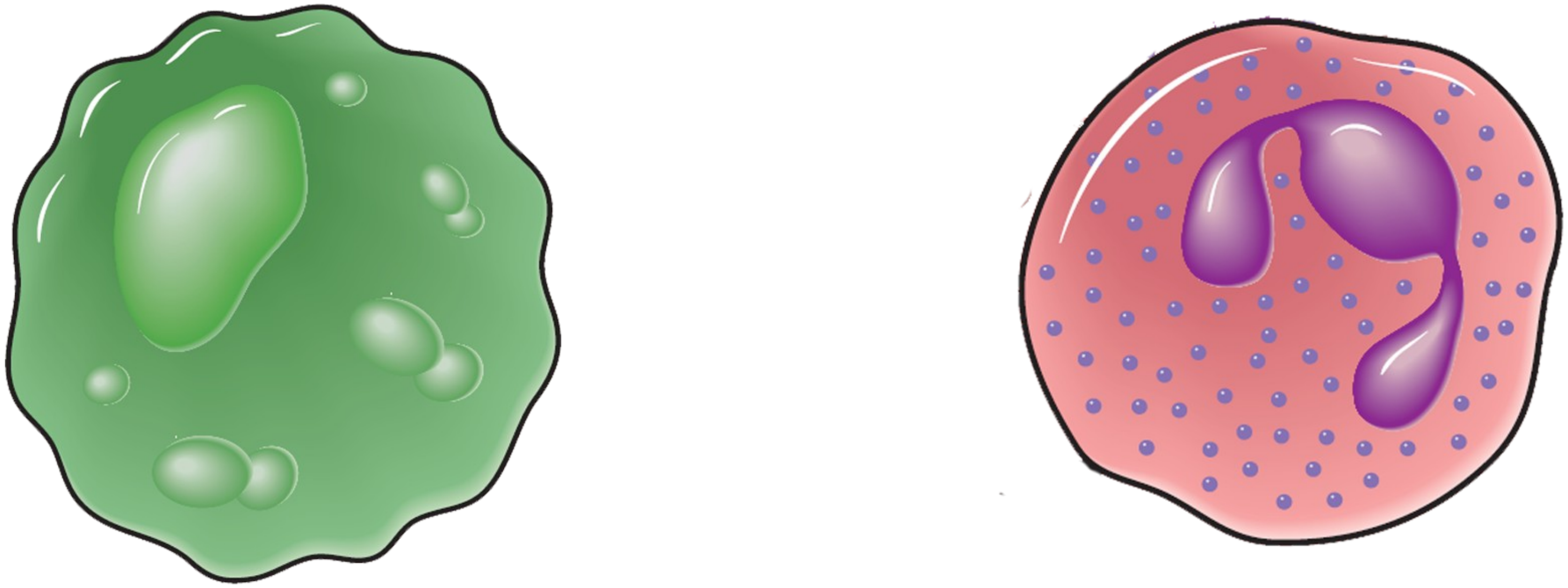
Complement

Cytokines

II) Secretion of effector proteins

A Cytokines

Small proteins



Produced by all immune cells

Cytokines of innate immunity

A Proinflammatory cytokines

IL =Interleukin

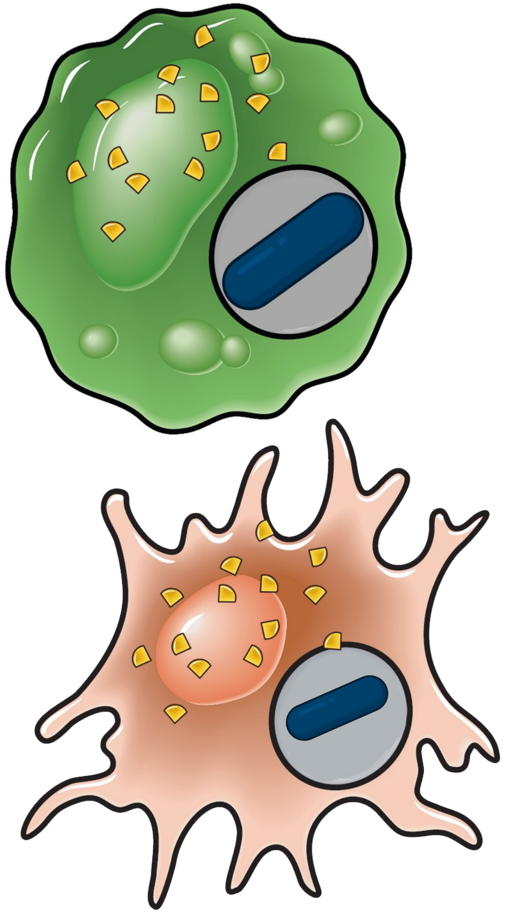
1) TNF-α (tumor necrosis factor), معامل نخرالسرطان
2) IL1
3) IL 6
4) IL-8

B Type I Interferon :

Proinflammatory cytokines

TNF α (tumor necrosis factor-α), IL1 & IL6

- ➲ Source



التهاب
موضعي

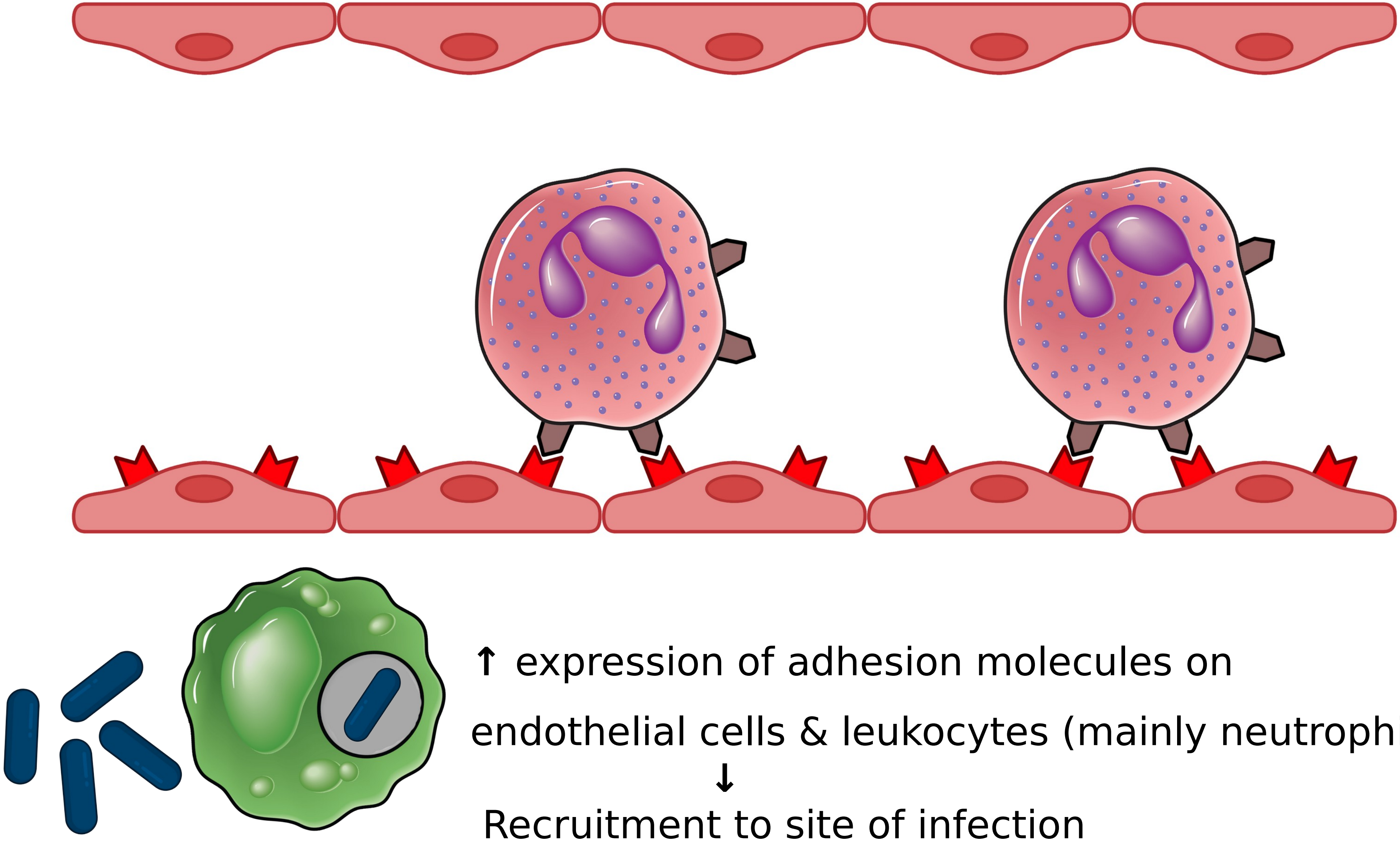
حماية
منتشرة

Outcome of

phagocytosis

➲ Function

1) Local inflammation



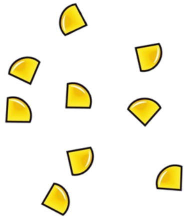
↑ expression of adhesion molecules on

endothelial cells & leukocytes (mainly neutrophils)

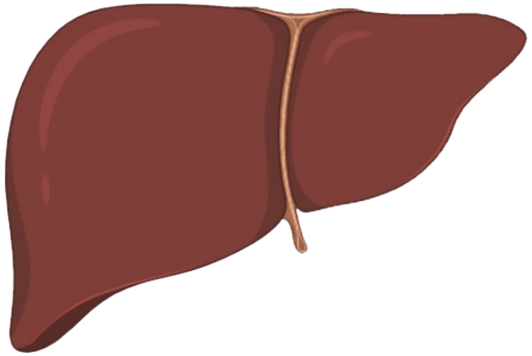
↓

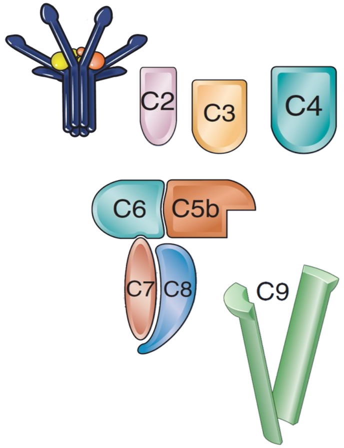
Recruitment to site of infection

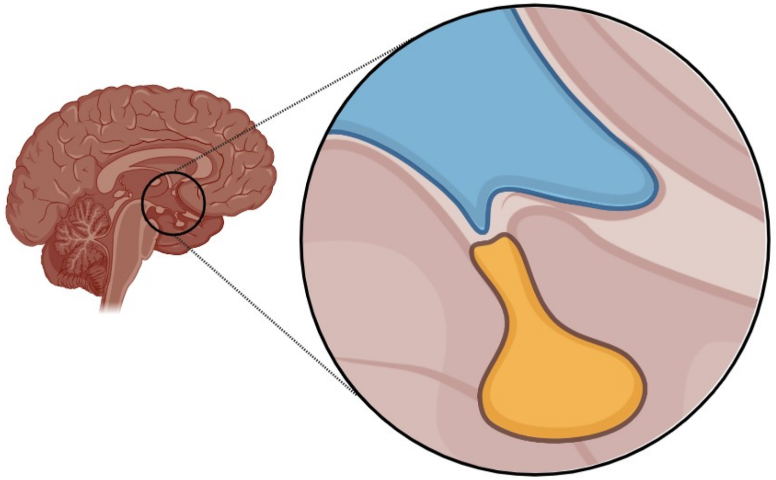
2) Systemic protective effects (LB)

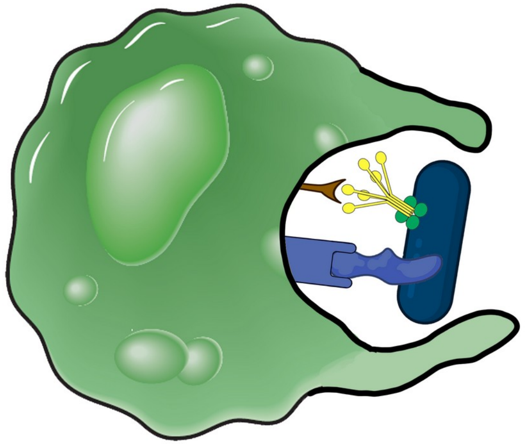


TNF α
IL-1
IL-6



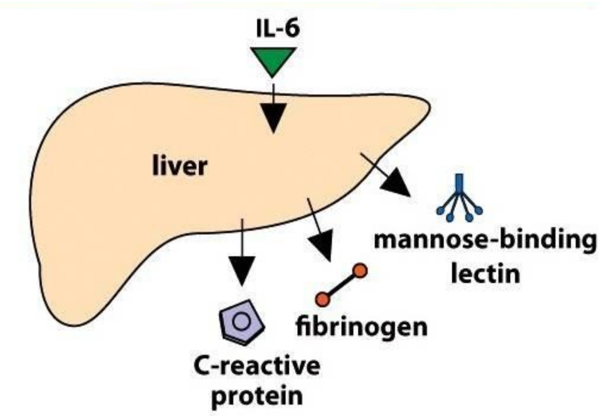


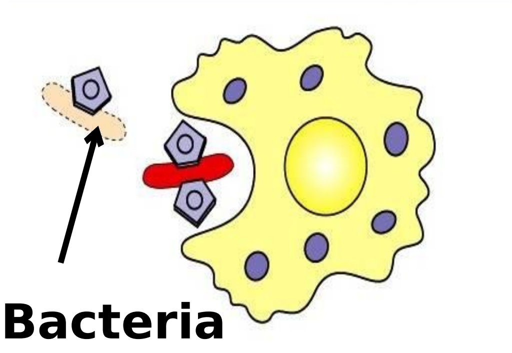


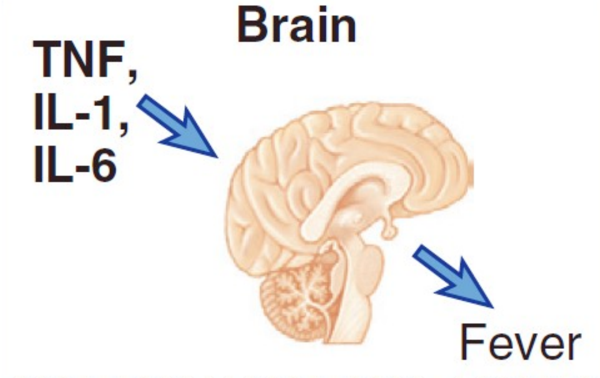


2) Systemic protective effects (LHB)

On Liver	The 3 cytokines induce synthesis of acute phase proteins e.g Mannose binding lectin ↓ Bind to microbes { enhance phagocytosis (opsonins) activate complement
On Brain	Fever







IL-8

مغناطيس كيمياءي

Function

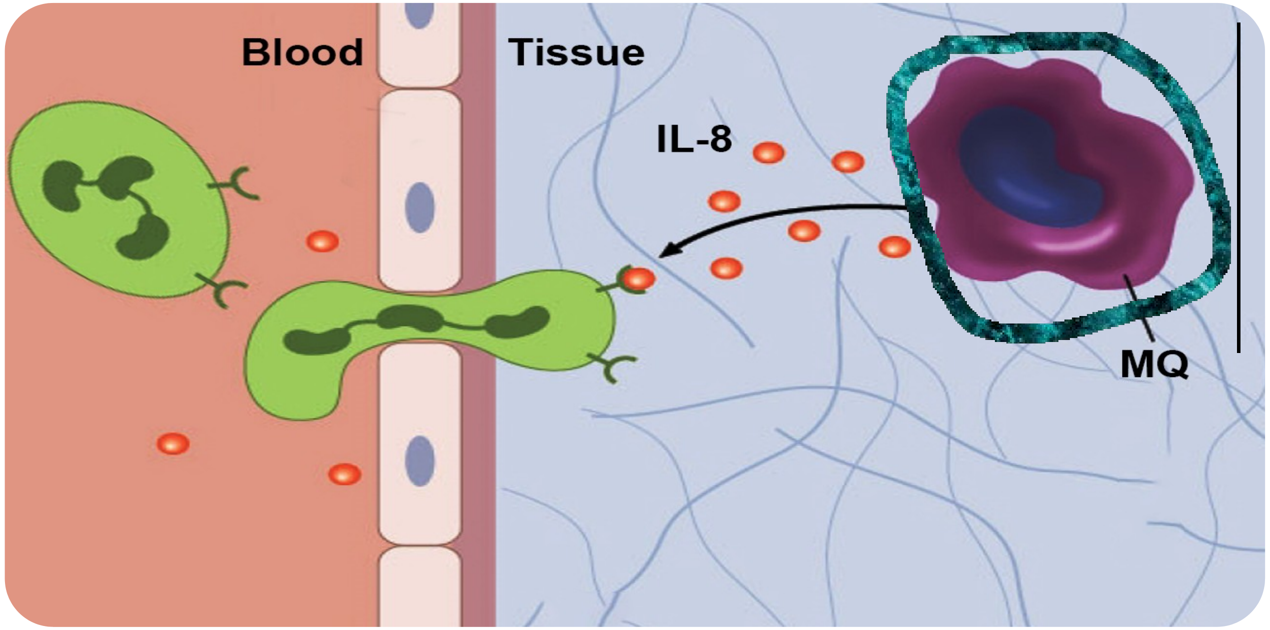
انجذاب كيميائي

Induce chemotaxis(chemical attraction of leukocytes)

↓

Recruit leukocytes from blood

into sites of infection

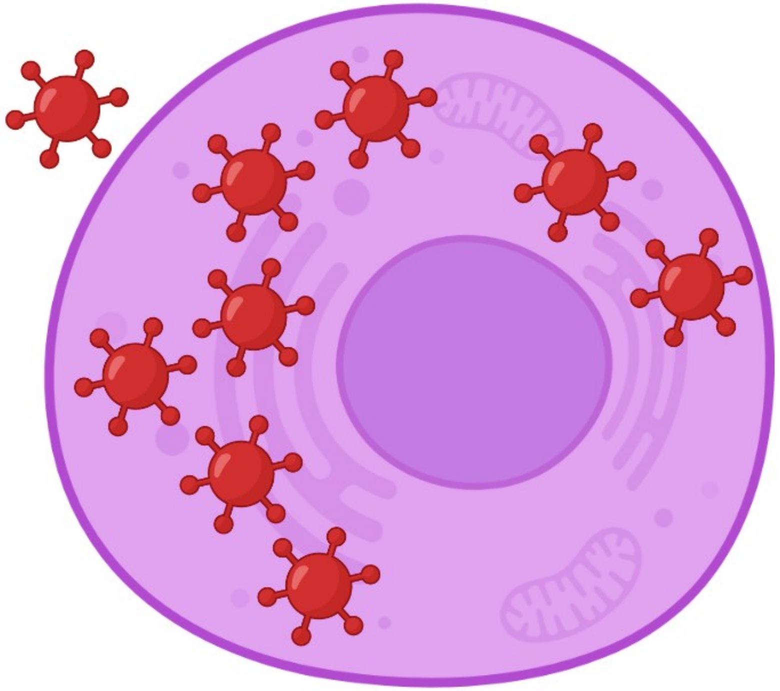


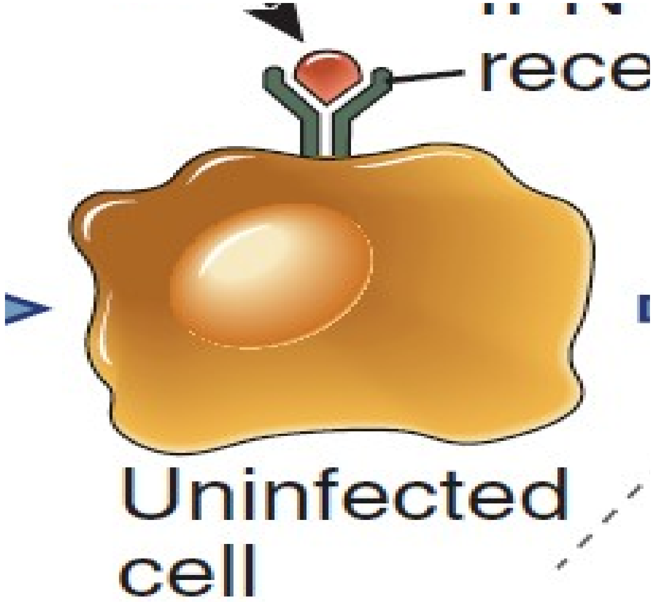
Type I Interferon (IFN) : IFN **α** and **β**

Interfere with viral replication

يعوق تكاثر الفيروس

Diseased cells





يجب حمايتها من تكاثرالفيروس

Type I Interferon (IFN) : IFN **α** and **β**

Interfere with viral replication

➲ Source

synthesized by virus infected cells

➲ Function

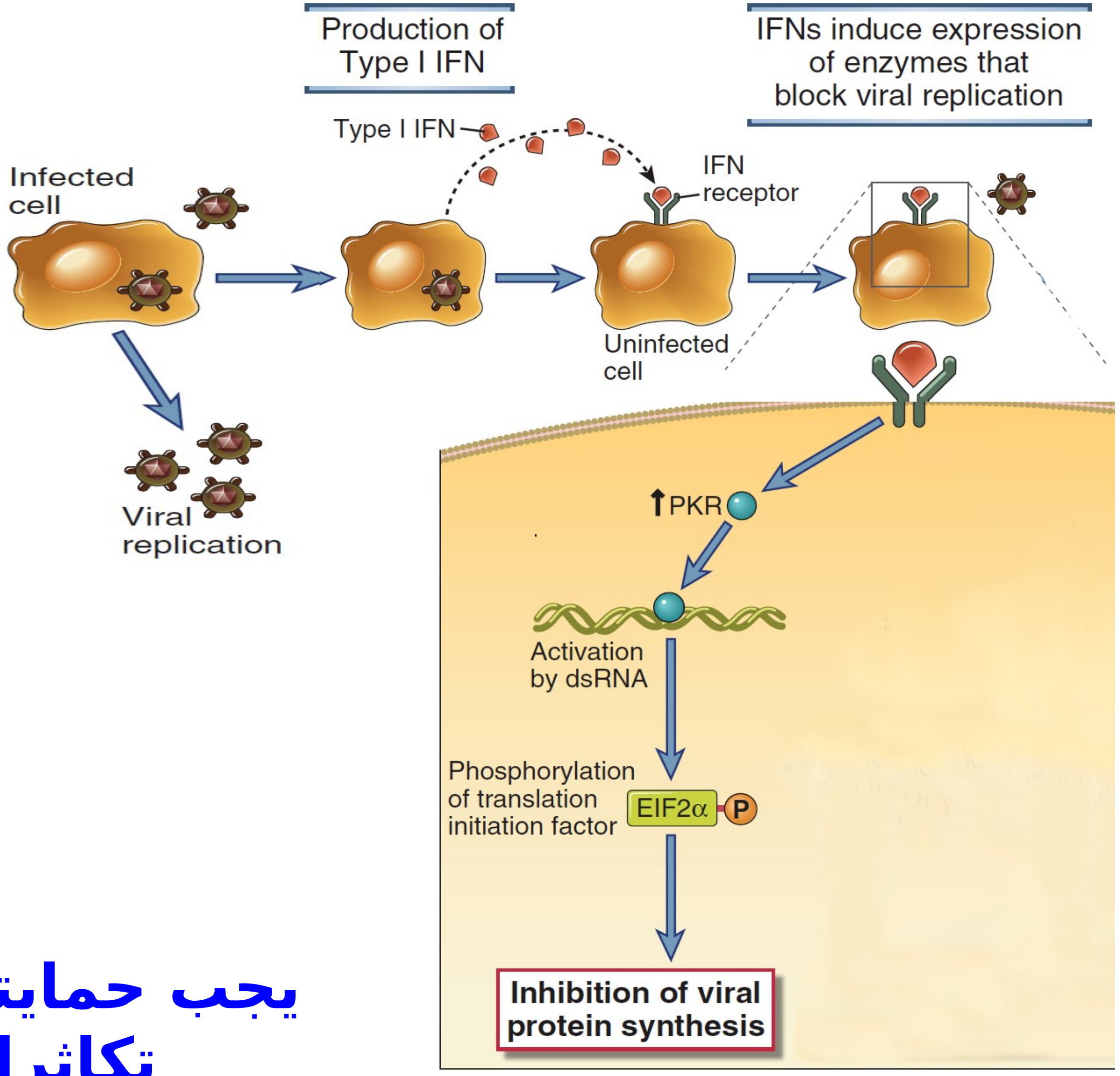
Main antiviral cytokine

that acts only on local cells :

Inhibits Viral replication

by ↓ protein synthesis

necessary for viral replication


Production of Type I IFN
IFNs induce expression of enzymes that block viral replication
Type I IFN
Infected cell
IFN receptor
Uninfected cell
Viral replication
↑PKR
Activation by dsRNA
Phosphorylation of translation initiation factor
EIF2α
P
Inhibition of viral protein synthesis

يجب حمايتها من
تكاثر الفيروس

Cytokines of innate immunity

A Proinflammatory cytokines

IL =Interleukin

1) TNF-α (tumor necrosis factor), **معامل نخرالسرطان**
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3) IL 6
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C Type I Interferon: **α** and **β**

Main antiviral cytokine